Amendments to the Claims

1. (currently amended) An apparatus for correcting convergence errors in a rear projection television, comprising:

a cathode ray tube mounted inside an enclosure, the cathode ray tube configured to project output images onto a rear projection screen using an electron beam, in which a deflection of the electron beam is controlled by signals, the signals for controlling the electron beam including coarse and fine saw-tooth signals for horizontal deflection, and coarse and fine saw-tooth signals for vertical deflection;

a camera, mounted inside the enclosure, the camera configured to acquire an input image of a calibration pattern displayed on the rear projection screen by the cathode ray tube;

means, coupled to the camera, for measuring a distortion in the input image; and

means, coupled to the cathode ray tube, for converging the output images by adjusting the signals controlling the electron beam according to the distortion.

2. (original) The apparatus of claim 1, further comprising:

a plurality of cathode ray tubes mounted inside an enclosure, each cathode ray tube configured to project the output images onto the rear projection screen using a corresponding electron beam;

means for generating calibration images for each cathode ray tube, and wherein the camera is configured to acquire the input image of each calibration image;

means, coupled to the camera, for measuring the distortion in each input image; and

means, coupled to each cathode ray tube, for converging the output images of the plurality of cathode ray tubes by adjusting the signals controlling the corresponding electron beams according to the distortion.

3. (canceled)

4. (original) The apparatus of claim 1, in which an intensity of the electron beam is controlled.

5. (original) The apparatus of claim 1, in which the calibration pattern is a checkerboard of rectangles.

6. (original) The apparatus of claim 5, further comprising:

means for measuring a relative displacement of corners of the rectangles.

7. (canceled)

8. (currently amended) The apparatus of ~~claim 8~~ claim 1, further comprising:

an adder configured to sum the corresponding coarse and fine saw-tooth signals.

9. (currently amended) The apparatus of ~~claim 7~~ claim 1, in which each fine saw-tooth signal is adjusted according to a plurality of control points.

10. (original) The apparatus of claim 9, in which the plurality of control points correspond to a plurality of locations evenly distributed over the rear projection screen.

11. (original) The apparatus of claim 6, further comprising:

means for scanning a filter kernel across the input image to measure the relative displacement of the corners of the rectangles.

12. (original) The apparatus of claim 11, in which the filter kernel is a 2×2 checkerboard pattern.

13. (original) The apparatus of claim 12, in which the filter kernel is scanned one pixel at a time, further comprising;

means for evaluation the filter kernel at each pixel to obtain a filtered intensity value for each pixel in the input image.

14. (original) The apparatus of claim 13, in which maxima and minima intensities correspond to the corners.

15. (original) The apparatus of claim 13, further comprising:

means for fitting a second order polynomial model to the intensities to determine locations of the corners to a sub-pixel resolution.

16. (original) The apparatus of claim 1, in which the means for correcting the output images uses an inverted linear system model.

17. (original) The apparatus of claim 1, further comprising:

a second calibration pattern placed on the rear projection screen to calibrate the camera.

18. (original) The apparatus of claim 17, in which the second calibration pattern is projected on a front surface of the rear projection screen.

19. (original) The apparatus of claim 1, in which the means for correcting fits the output images to a size of the rear projection screen.

20. (original) The apparatus of claim 1, in which the means for correcting minimizes burn-in.

21. (original) The apparatus of claim 1, in which the means for correcting resizes output images in a letterbox format that is inside an area of the rear projection screen.

22. (original) The apparatus of claim 1, in which the output images are in a letterbox format that is inside an area of the rear projection screen, and in which an intensity of a portion of the rear projection screen is an average of an intensity of output images.

23. (original) The apparatus of claim 1, further comprising:

a laser pointer configured to illuminate a laser dot on the rear projection screen; and

means for detecting a location of the laser dot.

24. (original) The apparatus of claim 23, further comprising:

controlling the output images according to the location of the laser dot.

25. (original) The apparatus of claim 1, in which an exposure time of the camera is less than a frame rate of the output images to produce partial input images, and further comprising:

means for compositing the partial input images to produce complete input images.

26. (original) The apparatus of claim 1, in which the calibration patterns have a plurality of resolutions.

27. (original) The apparatus of claim 1, in which the calibration pattern is displayed as a positive image and negative image pair, and further comprising:

means for subtracting the positive image from the negative image to cancel effects of ambient background light.

28. (original) The apparatus of claim 1, in which the camera measures an amount of ambient light, and further comprising:

means for adjusting an intensity of the output images according to the measured ambient light.

29. (currently amended) A method for correcting convergence errors in a rear projection television, comprising:

mounting a plurality of cathode ray tubes inside an enclosure, each cathode ray tube configured to project output images onto the rear projection screen using a corresponding electron beam, in which a deflection of the electron beam is controlled by signals, the signals for controlling the electron beam including coarse and fine saw-tooth signals for horizontal deflection, and coarse and fine saw-tooth signals for vertical deflection;

generating calibration images for each cathode ray tube;

acquiring an input image of each calibration image by a camera mounted inside the enclosure;

measuring a distortion in each input image; and

converging the output images of the plurality of cathode ray tubes by adjusting the signals controlling the corresponding electron beams according to the measured distortions.